





Land Preservation *and* Restoration

Preserve and restore the land by using innovative waste management practices and cleaning up contaminated properties to reduce risks posed by releases of harmful substances.





The land preservation and restoration goal presents EPA's strategic vision for managing waste, conserving and recovering the value of wastes, preventing releases, responding to emergencies, and cleaning up contaminated land. The stakes can be high because uncontrolled wastes can cause acute illness or chronic disease and can harm the environment. Cleanup almost always costs more than prevention, and contaminated land can be a barrier to bringing jobs and revitalization to a community. Disposed wastes also represent a loss of important material and energy values.

EPA employs a hierarchy of approaches to protect the land, including reducing waste at its source, recycling waste for materials or energy values, managing waste effectively by preventing spills and releases of toxic materials, and cleaning up contaminated properties. We are helping develop public-private partnerships to conserve resources in key areas. Moreover, over the next 5 years, we will establish or update approved controls to prevent dangerous releases at approximately 500 hazardous waste treatment, storage, and disposal facilities and also will address 2 long-standing tribal waste management concerns: increasing the number of tribes covered by integrated waste management plans and cleaning up open dumps.

To reduce and control the risks posed by accidental and intentional releases of harmful substances, we plan to maintain a high level of readiness to respond to emergencies, lead or oversee the response at more than 1,600 hazardous waste removals and reduce by 25 percent the number of gallons of oil spilled by facilities subject to Facility Response Plan regulations relative to previous levels. EPA and its partners, and responsible parties will remediate contaminated land, reduce risk to the public, and enable communities to return properties to beneficial reuse. We will also apply leading-edge scientific research to improve our capability to assess conditions and determine relative risks posed by contamination at hazardous waste sites.

A handwritten signature in black ink that reads "Susan Parker Bodine".

Susan Parker Bodine
Assistant Administrator
Office of Solid Waste and Emergency Response

GOAL 3:

Land Preservation and Restoration

Uncontrolled, wastes released on the land can migrate—contaminating drinking water, causing illness or disease, and threatening healthy ecosystems. EPA is working to minimize risks and to preserve and restore land using the most effective waste management and cleanup methods available. We rely on a variety of strategies: reducing waste at its source, recycling, managing waste to prevent spills and releases, and cleaning up contaminated property. We are especially concerned about threats to our most sensitive populations: children, the elderly, and people with chronic diseases.

The Resource Conservation and Recovery Act (RCRA)¹ and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, or Superfund)² provide the legal authority for most of EPA's work to preserve and restore the land. We use Superfund authority to clean up uncontrolled or abandoned hazardous waste sites and return land to productive use. Under RCRA, we work in partnership with states and tribes to address risks associated with leaking underground storage tanks and generation and management of hazardous and non-hazardous wastes. Tribal governments are the

primary parties for setting standards, making environmental policy decisions, and managing programs consistent with federal standards and regulations for reservations, and our regional offices work directly with them as the recognized independent authorities for reservation affairs.

We also use authorities provided under the Clean Air Act,³ Clean Water Act,⁴ and Oil Pollution Act of 1990⁵ to protect against spills and releases of hazardous materials. Controlling the many risks posed by accidental and intentional releases of harmful substances presents a significant challenge. To minimize these risks, EPA integrates prevention, preparedness, and response efforts. We conduct spill-prevention activities to keep harmful substances from being

released to the environment. And we continue to improve our readiness to respond and minimize contamination and harm to the environment when spills do occur by coordinating with our partners at all levels of government, developing clear authorities, training personnel, and providing proper equipment.

EPA is committed to ensuring environmental justice for all people, regardless of race, color, national origin, or income. Recognizing that minority and/or low-income communities frequently may be exposed disproportionately

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to environmental harm and risks, we work through our land preservation and restoration program to protect them and other burdened communities from adverse human health and environmental effects. We implement these programs consistent with existing environmental and civil rights laws and their associated regulations, as well as the Executive Order 12898, “Federal Actions

to Address Environmental Justice in Minority Populations and Low-Income Populations.” Ensuring environmental justice means not only protecting human health and the environment for everyone, but also making certain that all people are treated fairly and given the opportunity to participate meaningfully in making decisions that will affect their health and communities.

OBJECTIVE 3.1: PRESERVE LAND

BY 2011, REDUCE ADVERSE EFFECTS TO LAND BY REDUCING WASTE GENERATION, INCREASING RECYCLING, AND ENSURING PROPER MANAGEMENT OF WASTE AND PETROLEUM PRODUCTS AT FACILITIES IN WAYS THAT PREVENT RELEASES.

Sub-objective 3.1.1: Reduce Waste Generation and Increase Recycling. By 2011, reduce materials use through product and process design, and increase materials and energy recovery from wastes otherwise requiring disposal.

Strategic Targets

- By 2011, increase reuse and recycling of construction and demolition debris by 6 percent from a baseline of 59 percent in 2003.
- By 2011, increase the use of coal combustion ash to 50 percent from 32 percent in 2001.
- By 2011, increase by 118 the number of tribes covered by an integrated waste management plan compared to FY 2006.
- By 2011, close, clean up, or upgrade 138 open dumps in Indian country⁶ and on other tribal lands⁷ compared to FY 2006.

Sub-objective 3.1.2: Manage Hazardous Wastes and Petroleum Products Properly.

By 2011, reduce releases to the environment by managing hazardous wastes and petroleum products properly.

Strategic Targets

- By 2011, prevent releases at 500 RCRA hazardous waste management facilities by implementing initial approved controls or updated controls. (The universe of facilities will be reassessed in FY 2009. However, we currently estimate that there will be about 820 facilities that will require these controls. The goal of 500 represents about 60 percent of the universe of 820 facilities.)
- By 2011, increase the percentage of UST facilities that are in significant operational compliance with both release and detection and release prevention requirements to 71 percent from 66 percent in 2006



(an increase of 5 percent) out of a total estimated universe of approximately 245,000 facilities.

- Each year through 2011, minimize the number of confirmed releases at UST facilities to 10,000 or fewer from a universe of approximately 650,000 UST tanks.

MEANS AND STRATEGIES FOR PRESERVING LAND

In setting goals for conserving resources and managing waste under our Resource Conservation Challenge Program, EPA has high aspirations for our nation. We are striving for a future when materials once considered wastes suitable only for landfills will be continually reused and recycled, when “industrial ecology” will be the mantra of corporate executives across the nation, and when our landfills will become obsolete.⁸ To lead this move toward sustainability, we are establishing a national challenge to recycle 40 percent of our municipal solid waste by 2011.⁹ Meeting this challenge will take the combined efforts of all levels of government, large and small businesses, and dedicated citizens. It will mean that we have reached a milestone on the path to a future when we produce no waste at all.

We will work with stakeholders to establish effective strategic targets that benchmark and quantify our environmental progress toward sustainable resource conservation. These targets will provide a vivid picture of the significant environmental and economic benefits of reducing, reusing, and recycling materials. Under our Resource Conservation Challenge, we have set new targets for recycling construction and demolition debris and for using coal combustion ash rather than disposing of it. In the coming years, we will focus on developing a target or targets that contribute to the national 40 percent municipal solid waste recycling challenge, and we will be developing broader

measures that capture the benefit of our resource conservation efforts. (As EPA makes the transition to new measures, we will maintain the goal of recycling 35 percent of municipal solid waste by 2008.)

ESTABLISHING AND EXPANDING PARTNERSHIPS

We are establishing and expanding partnerships with industry, states, and other entities to reduce waste generation and develop and deliver tools that will help businesses, manufacturers, and consumers prevent waste and increase recycling. Our WasteWise and Coal Combustion Products Partnership programs, for example, capitalize on voluntary efforts to reduce waste and increase recycling and serve as models for new alliances between agencies, industries, and businesses.

For more information go to: www.epa.gov/epaoswer/non-hw/reduce/wastewise/about/index.htm and www.epa.gov/epaoswer/osw/conservation/c2p2/index.htm.

We will continue to support our tribal partners in improving practices for managing solid waste on Indian lands.¹⁰ EPA is responsible for implementing RCRA hazardous waste and UST programs directly in Indian country. Recognizing the challenges unique to tribal lands, we will work with tribes on a government-to-government basis in a way that affirms our federal trust responsibility to the 572 federally-recognized tribal governments and acknowledges the importance of conserving natural resources for cultural uses. To upgrade tribes solid waste management



Preserving Resources,
Preventing Waste



infrastructure, we will continue to work with them to develop integrated waste management plans, codes, ordinances, recycling programs, and alternatives to open dumping. Through these efforts, we will help to clean up existing dumps, reducing the risks they pose to human health and the environment. A municipal solid waste landfill is considered to be an “open dump” if it does not meet EPA’s Municipal Solid Waste Landfill Criteria, and is considered “upgraded” when modified so that it meets such criteria.¹¹ Over the next 5 years, EPA will build on the work of the National Interagency Workgroup, which annually contributes funding to the Solid Waste Assistance Grant Program for tribes, and we will forge partnerships with other federal agencies to identify and resolve waste problems in Indian country and on other tribal lands.

STIMULATING INFRASTRUCTURE DEVELOPMENT, PRODUCT STEWARDSHIP, AND NEW TECHNOLOGIES

A key strategy for reducing waste is developing infrastructure that will make it easier for industry, businesses, and consumers to reduce the waste they generate, to acquire and use recycled materials, and to purchase

products containing recycled materials. We will continue to promote development of new and expanded markets for recycled materials and new and better recycling technologies. In addressing municipal solid waste, we will focus on specific commodity streams—paper, organics, containers, packaging, and electronics—which offer great potential for recycling. The carpets and electronics sectors, for example, present promising opportunities for collaboration because key industries and states recognize the environmental benefits to be derived from reducing waste. Similarly, our new GreenScapes partnership www.epa.gov/greenscapes will increase end-markets for compost while teaching homeowners how to save time, money, and natural resources by reducing and recycling their yard wastes.

EPA also is working with tribes to increase recycling and composting at large, public venues such as tribally-owned and operated casinos, shopping centers, and amphitheaters. “Recycling on the Go”¹² projects in such locations can prevent recyclable and compostable materials from reaching landfills. Such projects also promote partnerships and build strong working relationships between EPA, tribes, and local governments.

We will continue to promote recycling of industrial by-products, concentrating on three large-quantity material streams: coal combustion products, construction and demolition debris, and foundry sands. Our Coal Combustion Products Partnership (www.epa.gov/epaoswer/osw/conserv/c2p2/index.htm) will prevent waste by encouraging the beneficial use of coal combustion products. EPA’s construction initiative (www.epa.gov/epaoswer/osw/conserv/priorities/bene-use.htm) will foster recycling of industrial materials, including construction and demolition debris, in major transportation and building construction projects. Through the Green Highways Initiative (<http://www.greenhighways.org/>), we will collaborate with government, business, and



industry to reuse industrial materials for transportation sector needs; reduce, reuse, and recycle municipal solid waste; and consider options for “green procurement.” And we will continue working with the foundry industry to encourage recycling of spent foundry sands and develop a numerical goal to quantify these efforts.

EPA will also promote new and better recycling technologies and ways to obtain energy or products from waste. For example, through bioreactor technology, which accelerates stabilization of municipal solid waste, the collection of landfill gases containing methane offers promise as a source of energy. We will continue to support initiatives that revamp technologies to reduce or eliminate the use of virgin materials, recover energy to produce power, and improve waste management.

PROVIDING EDUCATION, OUTREACH, TRAINING, AND TECHNICAL ASSISTANCE

As a result of EPA’s continuing outreach to nonprofit organizations, major retailers, electronics manufacturers, and other industries, messages on conservation, waste prevention, and recycling have become more prevalent. These messages increase public awareness of waste disposal issues, encouraging consumers, young people, and underserved communities to make smarter, more responsible environmental choices. We will work with our partners to encourage students and teachers to begin innovative recycling programs, and we will develop unique tools and projects to promote waste reduction, recycling, and neighborhood revitalization in Hispanic and African-American communities and on Indian lands. By funding training programs and providing resources for tribal employees, EPA will continue to support the development of tribal waste management programs, including adequate and recently-approved, integrated solid waste management plans, community education and outreach, and other cleanup activities.

ADDRESSING GLOBAL CONCERNS THROUGH PARTNERSHIPS

Because waste management and recycling of paper, plastics, and electronics have become increasingly global enterprises, “Global Environment” is a core priority in EPA’s Action Plan (www.epa.gov/adminweb/administrator/actionplan.htm). EPA waste management programs will continue working with other countries and international agencies to devise efficient, rational solutions and voluntary and regulatory initiatives to protect the global environment.



Through our membership on the Commission for Environmental Cooperation’s Hazardous Waste Task Force, EPA will promote the safe handling of waste imports and exports among North American Free Trade Agreement countries. This work will improve tracking of transboundary hazardous waste shipments, strengthen compliance, enhance border security, and reduce administrative burden and costs to private and government agencies in the United States and abroad. Under the U.S.-Mexico Border 2012 Plan (<http://www.epa.gov/usmexicoborder/intro.htm>), EPA will work with Mexican authorities to clean up and prevent tire piles and remediate contaminated sites along the border. In other international efforts, we will work with the Organization for Economic Cooperation and Development to minimize waste generation, remove barriers to recycling, and streamline exports and imports of



hazardous waste recyclables;¹³ work with a global public-private partnership under the Basel Convention to enhance the design, collection, reuse, and recycling of mobile phones; and, under the auspices of the International Maritime Organization's environmental committee, participate in negotiations (through 2009) to develop a new international convention for the safe and environmentally sound dismantling and recycling of ships.

MANAGING HAZARDOUS WASTES AND PETROLEUM PRODUCTS

A key element of EPA's strategy for managing hazardous wastes that must be treated, stored, or disposed is making waste management facilities more efficient. Working with our state, tribal, and local government partners, we are focusing on permitting processes and improving permitting conditions where appropriate. EPA will continue to work with authorized states—particularly those with a large number of facilities lacking initial approved controls—to remove obstacles to obtaining permits or putting other approved controls in place and to transfer successful strategies from other states.

Today, while the vast majority of the approximately 650,000 active USTs have the required leak detection and other equipment in place, significant work remains to ensure that UST owners and operators maintain and operate their systems properly.¹⁴ RCRA Subtitle I allows state UST programs approved by EPA

to operate in lieu of the federal program, and EPA recognizes that the number and diversity of UST systems puts state authorities in the best position to regulate USTs and set program priorities.¹⁵ As a result, even states that have not received formal state program approval from EPA are most often the primary implementing agencies and receive annual grants from EPA. We will continue to support state programs; strengthen partnerships among stakeholders; and provide technical assistance, compliance assistance, and training to promote and enforce UST facility compliance. We will work with states on innovative approaches and outreach and education tools designed to bring more tanks into compliance.

The Energy Policy Act, which focuses on preventing releases to keep our nation's land and water safe, will require major changes to federal and state UST programs. The Energy Policy Act extends the LUST Trust Fund tax through 2011; and includes provisions regarding inspections, operator training, delivery prohibition, secondary containment, financial responsibility, and cleanup of releases that contain oxygenated fuel additives. EPA and states will work closely with tribes, other federal agencies, tank owners and operators, and other stakeholders to bring about the mandated changes affecting UST facilities, ultimately increasing compliance and preventing UST releases.



OBJECTIVE 3.2: RESTORE LAND

By 2011, CONTROL THE RISKS TO HUMAN HEALTH AND THE ENVIRONMENT BY MITIGATING THE IMPACT OF ACCIDENTAL OR INTENTIONAL RELEASES AND BY CLEANING UP AND RESTORING CONTAMINATED SITES OR PROPERTIES TO APPROPRIATE LEVELS.

Sub-objective 3.2.1: Prepare for and Respond to Accidental and Intentional Releases. By 2011, reduce and control the risks posed by accidental and intentional releases of harmful substances by improving our nation's capability to prevent, prepare for, and respond more effectively to these emergencies.

Strategic Targets

- By 2011, achieve and maintain at least 95 percent of the maximum score on readiness evaluation criteria in each region.
- By 2011, complete an additional 975 Superfund-lead hazardous substance removal actions. (In FY 2005, 175 of these actions were completed.)
- By 2011, oversee and complete an additional 650 voluntary removal actions. (In FY 2005, 137 of these actions were completed.)
- By 2011, reduce by 25 percent the gallons of oil spilled by facilities subject to Facility Response Plan regulations relative to the 601,000 gallons of oil spilled in 2003.
- By 2011, inspect (and ensure compliance at) 90 percent of the estimated 4,200 facilities subject to Facility Response Plan regulations, up from 50 percent in 2004.

Sub-objective 3.2.2: Clean Up and Revitalize Contaminated Land. By 2011, control the risks to human health and the environment at contaminated properties or sites through cleanup, stabilization, or other action and make land available for reuse.

Strategic Targets

- By 2011, make final assessment decisions at 40,491 of 44,700 potentially hazardous waste sites evaluated by EPA to help resolve community concerns on whether these sites require long-term cleanup to protect public health and the environment and to help determine if they can be cleared for possible redevelopment. (By the end of FY 2005, a total of 38,770 final site assessment decisions had been made.)



- By 2011, control all identified unacceptable human exposures from site contamination for current land and/or groundwater use conditions at approximately 85 percent (1,316) of 1,543 Superfund human exposure sites. (The universe of 1,543 is the number of National Priorities List [NPL] sites with potential human exposure pathways as of FY 2005 and includes 172 Superfund federal facility sites. Baseline: By the end of FY 2006, approximately 82 percent [1,266] of sites had human exposures under control.) By 2011, increase to 95 percent the high National

Corrective Action Prioritization System (NCAPS)-ranked RCRA facilities with human exposures to toxins controlled. (The universe of all facilities that need RCRA Corrective Action will be finalized by the end of 2007 and will include high, medium, and low ranked facilities.)¹⁶



- By 2011, control the migration of contaminated groundwater through engineered remedies, natural processes, or other appropriate actions at 74 percent (1,017) of 1,381 Superfund groundwater sites. (The universe of 1,381 sites is the number of NPL sites with groundwater contamination as of FY 2005 and includes 166 Superfund federal facility sites. Baseline: By the end of FY 2005, 68 percent [937] of sites had groundwater migration under control.) By 2011, increase to 80 percent the high NCAPS-ranked RCRA facilities with migration of contaminated groundwater under control. (The universe of all facilities that need RCRA Corrective Action will be finalized by the end of 2007 and will include high, medium, and low ranked facilities.)¹⁷

- By 2011, reduce the backlog of LUST cleanups (confirmed releases that have yet to be cleaned up) that do not meet state risk-based standards for human exposure and groundwater migration from 26 percent to 21 percent. By 2011, increase to 22 percent the RCRA facilities with final remedies constructed. (The universe of all facilities that need RCRA Corrective Action will be finalized by the end of 2007 and will include high, medium, and low ranked facilities.)¹⁸ By 2011, complete construction of remedies at approximately 76 percent (1,171) of 1,547 Superfund sites. (The universe of 1,547 sites is the total number of sites on the NPL as of FY 2005 and includes 172 Superfund federal facility sites. Baseline: By the end of FY 2005, 62 percent or 966 sites had completed construction.) (Note that construction completion is a milestone which indicates that all significant construction activity has been completed, even though additional remediation may be needed for all cleanup goals to be met.)
- By 2011, ensure that 36 percent (345) of 966 final and deleted construction complete NPL sites are ready for reuse site-wide. (As of July 2006, 20 percent [195] of the 966 final and deleted construction complete NPL sites, including 14 Superfund federal facility sites, met EPA's definition for ready for reuse site-wide.)

Sub-objective 3.2.3: Maximize Potential Responsible Party Participation at Superfund Sites. Through 2011, conserve federal resources by ensuring that potentially responsible parties conduct or pay for Superfund cleanups whenever possible.

Strategic Targets

- Each year through 2011, reach a settlement or take an enforcement action before the start of a remedial action at 95 percent of Superfund sites having viable, liable responsible parties other than the federal government.
- Each year through 2011, address all unaddressed costs in statute of limitations cases for sites with unaddressed total past Superfund costs equal to or greater than \$200,000.

MEANS AND STRATEGIES FOR RESTORING LAND

EPA leads the federal effort to reduce risks posed by contaminated land by responding to releases and potential releases of harmful substances and undertaking cleanups and other activities to return land to beneficial use. We develop and implement prevention measures, improve response capabilities, ensure that response and cleanup actions are effective, and promote protective, sustainable, and productive uses of formerly contaminated properties. We collaborate with private organizations, communities, businesses, and government agencies at every level to accomplish these ends. We also work to increase public understanding of environmental issues and develop a sense of environmental stewardship for land that has been returned to beneficial use.

PREPAREDNESS AND RESPONSE

National preparedness is essential to ensure that emergency responders are able to deal with multiple, large-scale emergencies, including those that may involve chemicals, oil, biological agents, radiation, or weapons of mass destruction. EPA will continue to enhance its core emergency response program

by providing specialized training on the Incident Command System; developing additional health and safety materials; participating in exercises with federal, state, and local government agencies, including Regional Response Teams; and strengthening response readiness across multiple regions.

We also are working to improve coordination and communication. For example, as part of the National Incident Coordination Team, we will continue to improve mechanisms for coordinating responses to national emergencies. Under the Continuity of Operations/Continuity of Government program, we will upgrade and test plans, facilities, training, and equipment to ensure that essential government business can continue during a catastrophic emergency. And we will expand our National Response Team capabilities for coordinating large-scale responses with the Department of Homeland Security; Federal Emergency Management Agency; Federal Bureau of Investigation; and other federal, state, and local government agencies.

We also are improving our capability for responding to incidents involving harmful chemical, oil, biological, and radiological substances. Each year, EPA personnel assess, respond to, mitigate, and clean up thousands of releases—whether accidental, deliberate, or naturally occurring. These range from small spills at chemical or oil facilities to larger accidental releases in train and highway accidents, and from



natural disasters, such as hurricanes Katrina and Rita, to national emergencies, such as terrorist events. Over the next 2 years, we will expand our current core emergency response program to address prevention and preparedness and cover all aspects of emergency environmental management.

An important component of our land strategy is preventing oil spills and being prepared for spills that do occur so that oil does not reach our nation's waters. Under the Oil Pollution Act,¹⁹ we require certain facilities to develop Facility Response Plans (FRPs) for use in the event of a spill and to practice implementing them. At the end of FY 2004, EPA had inspected (and found in compliance) 50 percent of the estimated 4,200 FRP facilities; over the next 5 years we will work to ensure at least 90 percent compliance.

CLEANING UP AND REVITALIZING CONTAMINATED SITES

EPA's cleanup programs strive to protect Americans from risks posed by contaminated land; restore the nation's contaminated land; and enable communities safely to return these properties to beneficial economic, ecological, and social use. We work with our federal, state, tribal, and local government partners to identify sites and facilities that need attention and collaborate to clean them up.



EPA's One Cleanup Program is a long-term initiative that encourages our cleanup programs to work together and with all levels of government to ensure that appropriate cleanup tools are used; resources and activities are coordinated; results are effectively communicated to the public; and cleanups are protective and contribute to revitalizing communities, including those with environmental justice concerns. We will strive to treat people fairly, to provide equal opportunity for participating in cleanup decisions, and to ensure that no population bears a disproportionate burden or risk. The One Cleanup Program reflects our effort to coordinate all of EPA cleanup programs, yet provides the flexibility to accommodate different statutory authorities and approaches.

All of our cleanup programs include common elements: initial assessment, stabilization (when needed to control actual or potential exposure and protect local populations), site investigation, selection of appropriate site remedies, implementation and completion of remedies, and promotion of protective uses/reuses.

Investigating and Assessing Sites. With our partners, we identify the type and extent of contamination and the actual or potential exposure to people and environmental receptors. We use the data we collect to determine risks and to select remedies. To better address environmental justice concerns and identify areas that may suffer disproportionate impacts, we will encourage broader use of improved sample collection techniques, analytical tools, and indicators.

Selecting and Implementing Remedies. We select remedies based on such criteria as affected media (soil, air, groundwater, etc.), cleanup objectives, compliance with applicable laws, implementation issues, and acceptability to state and tribal governments and the affected communities. Cost and efficiency of the overall cleanup process are also important. When remedies involve leaving contamination in place, EPA will continue

to include institutional controls, such as notices and easements, to prevent inappropriate uses of the land or water and unacceptable exposures.

Completing Construction and Post-Construction. Once appropriate remedies have been selected, completing construction of all remedies at a site or facility is an important milestone for EPA's cleanup programs. For example, the RCRA program has developed a long-term goal of implementing and completing construction of final remedies at 95 percent of all facilities that need RCRA corrective action by 2020,²⁰ and we will be developing interim annual targets (such as our 2011 target of 22 percent) to measure progress toward this goal.²¹

The Superfund program conducts reviews every 5 years to ensure that the remedy is functioning as intended and remains protective. Given the many sites moving into the post-construction-completion stage, we will implement a strategy to manage post-construction-completion activities and ensure that response actions will protect human health and the environment for the long term (PCC Strategy www.epa.gov/superfund/action/postconstruction).

A key milestone for all cleanup programs is the point at which all cleanup goals for a particular remedy or an entire site/facility are achieved. This can mean that no contamination is left above levels of concern and that the land has no restrictions on its use or that site-specific goals that allow restricted uses of the property have been met. EPA's cleanup programs have set a national goal of returning formerly contaminated sites to long-term, sustainable, and productive use. EPA will continue to foster revitalization (www.epa.gov/oswer/landrevitalization/) by developing policies and systems for the safe long-term use of remediated land; identifying and removing unintended barriers to beneficial reuse of contaminated properties; working with the marketplace to make formerly contaminated properties commercially

attractive; and developing revitalization measures and indicators for all EPA cleanup programs.



MAXIMIZING POTENTIALLY RESPONSIBLE PARTY PARTICIPATION AT SUPERFUND SITES

Under Superfund Program enforcement authorities, EPA leverages private party resources to conduct cleanup actions and to reimburse the federal government for federally financed cleanups. We will continue to pursue two strategies for conserving federal funds: “Enforcement First” and cost recovery. Under the Enforcement First strategy, EPA takes enforcement actions at sites where viable, liable potentially responsible parties exist, requiring them to pay for or perform the cleanups. To ensure that these parties are able to meet their cleanup obligations, EPA developed a national strategy to assess companies' compliance with federal financial assurance requirements and will implement it over the next several years.

Cost recovery is another way to leverage private party resources. Superfund provides EPA the authority to compel private parties to pay back federal money spent to conduct cleanup activities.²² We will continue to address 100 percent of the unaddressed past costs for statute of limitations cases at sites with unaddressed total past Superfund costs equal to or greater than \$200,000 and to report the value of costs recovered.

OBJECTIVE 3.3: ENHANCE SCIENCE AND RESEARCH

THROUGH 2011, PROVIDE AND APPLY SOUND SCIENCE FOR PROTECTING AND RESTORING LAND BY CONDUCTING LEADING-EDGE RESEARCH, WHICH, THROUGH COLLABORATION, LEADS TO PREFERRED ENVIRONMENTAL OUTCOMES.

MEANS AND STRATEGIES FOR ENHANCING SCIENCE AND RESEARCH

EPA will continue to improve its capability to assess environmental conditions and determine the relative risks that contaminated land poses to health and the environment. We will ensure that the environmental data we collect are of known, documented, and acceptable quality by implementing necessary field and lab procedures, practices, and controls. We will continue to integrate technological advances to enhance our site investigation capabilities, implement cost-effective remedies, and improve the operation and maintenance of existing remedies. In addition, we will continue to coordinate with other agencies on our land research priorities.

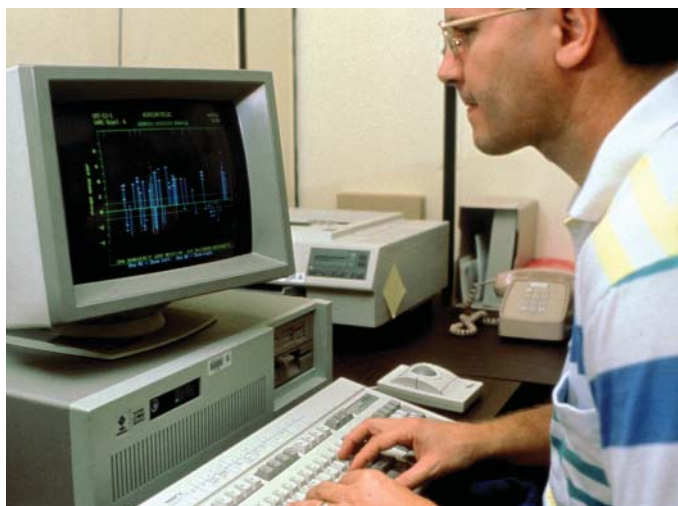
EPA scientists are developing methods for assessing multimedia risks, including the Multimedia, Multipathway, and Multi-receptor Risk Assessment (3MRA) modeling system to support the Hazardous Waste Identification Rule. As a part of this effort,

EPA will be conducting research to provide a preliminary risk screening for electronics waste and better understand the risks posed by hazardous constituents during recycling operations, disposal, or component reuse. The 3MRA model will also evaluate on a national basis relative risks of various waste disposal options for use in regulatory decision making. We have also planned research that targets specific materials for volume reduction and others for reuse and conservation.

To support cradle-to-cradle materials management, EPA scientists will evaluate landfill caps to improve containment technologies and conduct research on operating landfills as bioreactors. This research addresses operation and monitoring parameters and evaluates such risks as increased fugitive emissions. We will incorporate our findings in the training and technology transfer materials we provide to state permitting officials.

EPA's land research program helps accelerate scientifically defensible, cost-effective cleanup decisions at complex sites, in accordance with CERCLA. We are targeting our research to make measurable progress in managing material streams, conserving resources, and managing waste and in mitigating and managing contaminated sites.

Toward these ends, we will focus research on contaminated sediments, ground water contamination, site characterization, and technical support to reduce uncertainties in assessing contaminated sediments and develop and evaluate options for remediation. We are investigating sediment remedies with the potential to be more cost-effective than conventional dredging or capping remedies.



Research will also focus on bioremediation of organics, electrochemical degradation, and conventional and reactive landfill caps. To identify and explore best management practices, we will work with the U.S. Army Corps of Engineers and the Strategic Environmental Research and Development Program on a number of research projects to evaluate the field performance of dredging and capping of sediments.

We will continue ground water research—stressing ground water remediation of inorganic plumes and ground water-surface water assessment strategies—to develop applications for permeable reactive barriers and address fate and transport and treatment methods for contaminants. Our research on dense nonaqueous phase liquids (DNAPL) source remediation focuses on demonstrating, evaluating, and optimizing DNAPL remediation technologies; assessing and predicting

the benefits of partial DNAPL depletion; and developing and assessing integrated DNAPL source remediation approaches. Our technical support centers will continue to provide site-specific assistance.



Our research to support the LUST program will provide fate and transport studies and information on the effectiveness of remediation alternatives. Research on fate and transport and risk management strategies for petroleum and non-petroleum oil spills will support EPA and its partners in responding to oil spill emergencies.

HUMAN CAPITAL

EPA's emergency prevention, preparedness, and response staff are key to the Agency's ability to preserve and restore land. We will continue to ensure their readiness and protect their health and safety when responding to releases of dangerous materials or cleaning up contamination by providing annual on-scene coordinator readiness training conferences, specialized Incident Command System training, health and safety materials, and exercises with federal, state, and local government agencies. We will also enhance the capabilities of our workforce by acquiring and maintaining appropriate response equipment, providing experience with routine cleanup operations, and pre-deploying responders for national special security events. EPA's Superfund response program will develop and maintain the skill base needed to achieve its goals through numerous training and enhancement

programs focusing on needs identified in its competency gap analysis.

EPA's RCRA national waste management, waste minimization and recycling, and cleanup programs rely on a cadre of technically adept and program management-oriented people. Within the RCRA program, our development efforts include state-of-the-art technical training and focus on maintaining a superior level of competency in areas such as project management, communications, and other skills. These competencies are necessary to support our work with the vast array of public and private sector partners who are interested in waste and materials management. Our recruiting efforts have been particularly successful in bringing on high quality staff at the entry level to help us build a core group of seasoned employees who are ready to assume future leadership roles.

PERFORMANCE MEASUREMENT

To support our national goal of returning formerly contaminated sites to sustainable and productive use, all of EPA's cleanup programs are developing new measures of revitalization. As a first step, the Superfund program has set a "site ready for reuse" target to demonstrate cleanup progress. This measure tracks National Priority List sites where construction of the remedy is complete; where cleanup goals in the Record of Decision have been achieved such that there are no unacceptable risks associated with current and reasonably anticipated future uses; and where all institutional controls required in the Record of Decision have been implemented. These measures will capture the total number and acreage of sites for which EPA has some level of accountability, the number of sites and acres EPA has determined to be ready for reuse (or protective of existing uses), and whether and how the sites are being used (for industrial, commercial, residential, or other purposes).



To track our annual progress toward our research objectives, we will use a number of objective measures of customer satisfaction, product impact and quality, and efficiency. For example, we rely on independent expert review panel ratings, client surveys on the usefulness of our products, and analyses demonstrating the actual use of EPA research products.

Most of the strategic targets established for the waste management, UST, and Superfund programs are based on the long-term, outcome-oriented measures developed for use in the Office of Management and Budget's (OMB) Program Assessment Rating Tool (PART) assessments.

As a result of the self-evaluation we conducted during the FY 2005 OMB PART process, the Superfund program: (1) enhanced a key outcome measure to better communicate progress towards long-term human health; (2) added a new measure to reflect the lasting effects of land cleanup and restoration; (3) improved reporting on annual and long-term performance data to ensure accountability; and (4) implemented a new program review process and conducted its first benchmarking study to seek improved performance, effectiveness and efficiencies, and protection. The OMB PART for the Oil Removal Program led to new measures and related targets, as well as a commitment to develop a second long-term outcome measure and at least one annual outcome measure.

IMPROVING PERFORMANCE MEASUREMENT

As we considered revisions and improvements for this *Strategic Plan*, we also conducted a preliminary assessment of longer-term opportunities to better articulate strategic, outcome-oriented commitments. For our land goal, we identified four themes to help guide our efforts to improve our measures: extent of contaminated land; extent of land restored to potential use; extent of previously contaminated land in productive use; and impacts of waste-management efforts on human and environmental condition. These themes will help guide our efforts to improve our measures of performance.

USING FEEDBACK FROM PERFORMANCE ASSESSMENTS AND PROGRAM EVALUATIONS

In undertaking the PART process, the Superfund Program made several new commitments. It will encourage continuous improvement by strengthening its strategic planning—initiating regular procedures to track and document key decisions and work products. To improve the accuracy and reliability of its performance information, the program will evaluate the quality of data from key sources. Finally, the Superfund program will create a forum that allows regional offices to share best practices, resulting in an overall improvement in program performance and efficiency.

In July 2004, EPA's Science Advisory Board (SAB) conducted an advisory review of our Contaminated Sites and RCRA Multiyear Plans. The Board found the plans to be “programmatically and scientifically sound” and noted “the remarkable coordination of the program’s research with that of the relevant program offices and other institutions” and “the judicious use of leveraging opportunities to significantly stretch limited resources to meet more of the Agency’s needs.” In response to SAB recommendations, the research program combined the two multiyear plans into



one document and more clearly linked research activities to program activities under Objectives 3.1 and 3.2.

The SAB also reviewed the 3MRA modeling system and reported its findings in November 2004. EPA is addressing the Board’s recommendations by continuing to develop 3MRA modeling system validation protocols, modeling system evaluation, and additional uncertainty analysis.

EMERGING ISSUES AND EXTERNAL FACTORS

A number of emerging technologies present potentially important implications for waste management strategies and programs. Waste to Energy, a technology which uses waste materials that are unlikely to be recycled as feedstock for energy production, has significant implications for energy supply. Research is also being conducted on applying

nanotechnology to remediate hazardous waste sites. Using nanomaterials for remediation could enable more rapid or cost-effective cleanups than do current conventional approaches. (More information is available in the external peer review draft of EPA’s White Paper on Nanotechnology at www.epa.gov/osa/nanotech.htm.)

Our ability to respond as the federal on-scene coordinator for releases of harmful substances in the inland zone may be affected by several external factors. The National Response System ensures that EPA will respond when necessary, but relies heavily on the ability of responsible parties and state, local, and tribal agencies to respond to most emergencies. The need for EPA to respond is a function of the quantity and severity of spills that occur, as well as the capacity of state, local, and tribal agencies to address spills.



EPA's ability to respond to homeland security incidents is affected by circumstances surrounding each event. For instance, if travel or communication is severely impeded, our response may be delayed or less efficient. In the case of a single large-scale incident, our resources are likely to be concentrated on that response, reducing our ability to address other emergency releases that may occur. In severe cases, our current emergency response workforce and resources may not be sufficient to address simultaneous large-scale incidents.

A number of external factors could also substantially affect our ability to achieve our objectives for cleanup and prevention. These

include our reliance on private-party response and state and tribal partnerships, new environmental technologies, other federal agencies' efforts, and statutory barriers. Because states are primarily responsible for implementing the RCRA Hazardous Waste and UST programs, our ability to achieve our goals depends on the strength and funding of state programs. Similarly, our success in meeting our goals for compliance depends on a strong state presence.

The Superfund Program was intended to provide permanent site solutions to the extent practicable. Complications can arise, however, when new scientific information suggests that cleanup decisions were based on outdated risk assessments. As appropriate, the Superfund Program must incorporate emerging science into decision making while maintaining its commitment to provide permanent solutions.

Achieving our waste reduction and recycling objectives will depend on federal, state, tribal, local government, industry, and public participation in partnerships to reduce waste generation and increase recycling. EPA provides national leadership to encourage these partnerships and to promote the campaign to reduce or reuse waste that would ultimately be sent for disposal. However, both domestic and foreign economic stresses can adversely affect markets for recovered materials.

Finally, we rely on our partnerships with other federal agencies and tribal governments to upgrade, clean up, or close open dumps in Indian country and to provide tribes access to information on modern waste management. And to achieve our objectives for waste management on tribal lands, EPA will continue to depend on cooperation and participation by tribes and other federal agencies.

NOTES

1. 42 U.S. Code 6901-6992k.
2. 42 U.S. Code 9601-9675.
3. 42 U.S. Code 7401-7671q.
4. 33 U.S. Code 1251-1387.
5. U.S. Code 2701-2761.
6. Use of the terms “Indian country,” “Indian lands,” “tribal lands,” “tribal waters,” and “tribal areas” within this *Strategic Plan* is not intended to provide any legal guidance on the scope of any program being described, nor is their use intended to expand or restrict the scope of any such programs.
7. Ibid.
8. Beyond RCRA: Waste and Materials Management in the Year 2020 (www.epa.gov/epaoswer/osw/vision.htm).
9. In the 2003-2008 *Strategic Plan*, EPA established a goal of 35 percent recycling of municipal solid waste by 2008. EPA will continue to measure progress toward this goal through 2008.
10. Use of the terms “Indian country,” “Indian lands,” “tribal lands,” “tribal waters,” and “tribal areas” within this *Strategic Plan* is not intended to provide any legal guidance on the scope of any program being described, nor is their use intended to expand or restrict the scope of any such programs.
11. U.S. EPA’s Municipal Solid Waste Landfill Criteria are defined in 40 CFR 257 and 258.
12. U.S. EPA, Office of Solid Waste and Emergency Response. Resource Conservation Challenge/Recycling on the Go web site: www.epa.gov/osw/conserves/onthe-go/.
13. Core Performance Elements of the Guidelines for Environmentally Sound Management of Wastes, April 24, 2003, Environment Policy Committee, OECD.
14. Memorandum from Cliff Rothenstein, Director, EPA Office of Underground Storage Tanks to Underground Storage Tank Division Directors in EPA Regions 1-10, dated December 15, 2005. *FY 2005 End-of-Year Activity Report*.
15. 42 U.S. Code 6901-6992k.
16. The 2020 RCRA Corrective Action universe will include all facilities that need RCRA corrective action as well as those on the current high-priority list, additional facilities that have a permitting obligation, and other appropriate and important facilities identified by EPA regions and states.
17. Ibid.
18. Ibid.
19. 33 U.S. Code 2701-2761.
20. Beyond RCRA www.epa.gov/epaoswer/osw/vision.htm.
21. The 2020 RCRA Corrective Action universe will include all facilities that need RCRA corrective action as well as those on the current high-priority list, additional facilities that have a permitting obligation, and other appropriate and important facilities identified by EPA regions and states.
22. 42 U.S. Code 9601-9675.